

Europeans push antidumping
tariffs Page 20

MAY 2, 1983

CHEMICAL & ENGINEERING

NEWS

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C&EN's Top

50

Chemical
Products &
Producers

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News of the Week

■ First-quarter earnings indicate chemical industry recovery from the recession will be gradual. Page 6

■ GAF will liquidate by selling its chemicals business to Allied for \$410 million. Page 7

■ Chemical industry influenced government's decision to reject international system of premarket testing, subcommittee says. Page 7

■ National Academy of Sciences elects 60 new members, 18 in chemistry or related fields. Page 8

International

Rise in product dumping in EEC countries attributed to economic downturn by former CEFIC official in C&EN interview. Page 20

Government

Lack of toxicity data in premanufacture notifications required under TSCA may prompt Congress to amend the act. Page 34

Supreme Court says no to ban on restarting TMI reactor, yes to California moratorium on nuclear plants. Page 35

Technology

Commercial projects for space station are the goal of Booz-Allen as it hunts potential users with seed concepts. Page 37

The local chemical lab may be as popular as the small-town doctor if California entrepreneur's idea catches on. Page 38

Resin Rinse, a maintenance treatment to prevent fouling of resin beads, developed by Nalco Chemical. Page 39

AIC Award

Medalist Mary Good says the transition from professor to industry executive has not been difficult. Page 40

ACS News

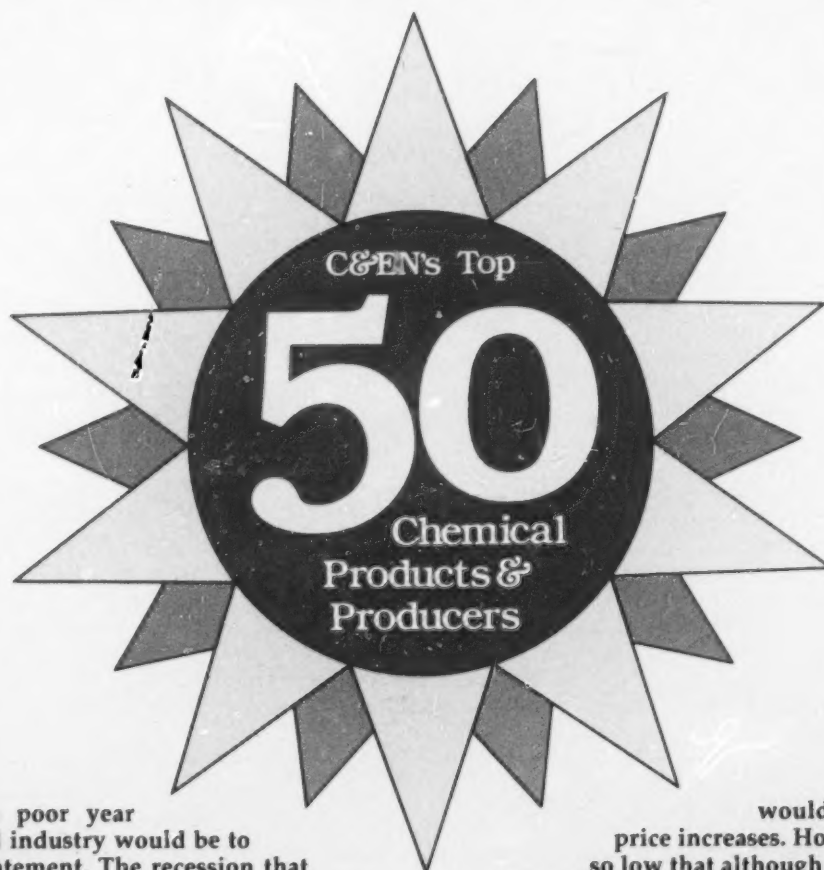
Chemical education study implemented by ACS task force to parallel NAS study; both aim to influence federal spending. Page 42

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Top 50

C&EN's annual ranking of Top 50 chemical products and producers confirms recession's toll on production and profits. Page 9



To call 1982 a poor year for the chemical industry would be to deal in understatement. The recession that gripped the chemical industry and indeed the U.S. as a whole for the past couple of years deepened to a point that brought industry momentum to a halt and even backed it up considerably.

The massive effects of the recession on the chemical industry are readily apparent in C&EN's annual survey of the Top 50 chemical products and the Top 50 producers. The results show what is the worst time for the U.S. chemical industry in many years.

For instance, output of the 50 basic chemicals covered in the survey dropped 14% in 1982 from 1981 after what now seems to be a moderate drop of only 1% in 1981 from the year before.

The production drop was pervasive with both inorganics and organics dropping to levels not seen since before 1977. Organics output fell 10% during the year and that of inorganics, which had suffered the most the year before, dropped 15%.

With the output of chemical products falling fast, the only way that producers could recoup their losses

would have been through price increases. However, demand was so low that although prices began a little higher at the beginning of 1982, by the end of the year they were below year-earlier levels.

Thus, total value of chemical sales of the Top 50 chemical producers fell almost as fast as production volume. Chemical sales among the Top 50 producers dropped almost 11% during the year.

Therefore, chemical producers were left with having to invoke severe cost-cutting measures to salvage the year, but even these did not stem the tide. Operating profits for the 50 chemical producers were more than cut in half. And their operating profit margins dropped 4.0% in 1982 from 8.0% the year before; return on assets fell to 4.6% from 10.1%.

The only thing left is for chemical producers to look for better times in 1983. And it looks as though they may get them, in spite of what turned into a bad first quarter. Most analysts predict that although the first half may well be slow, the second half of 1983 will show very positive signs of improvement over 1982; indeed it could be a much more profitable year.

Basic chemical output fell third year in row

David Webber, C&EN New York

A year ago the chemical industry learned to its shock that production of the 50 largest-volume chemical commodities in 1981 had declined for the second year in a row. Such a sequence of losses had never been recorded in a business full of people who until recently believed uninterrupted growth was their manifest destiny. Now, with a crashing 14% further production drop in 1982, the industry is riding a three-year losing streak.

But that's not the most disturbing picture to emerge from C&EN's annual survey of the Top 50 chemical products. A 14% decline is bad, but there are strong indications that this year's anticipated rebound will make up for a good share of that. What must be especially troubling to many in the industry, however, is that for the first time ever, production over a five-year span—from 1977 to 1982—actually shows a decline. Even for the 10-year period be-



ginning in 1972, compounded annual growth in production has been a meager 1%. Such poor figures can only reinforce the increasingly prevalent belief that the chemical industry is, by and large, maturing (C&EN, April 11, page 11).

The erosion of vitality has not been the result of a few, very-large-volume commodities having some bad years. The trend is pervasive. In 1982, 46 of the Top 50 chemical products registered production lower than the year before. By comparison, in 1981, 26 products had lower output than in 1980. Similarly, in the five-year pe-

riod ending in 1982, 37 products showed a production loss. Last year, output of only 14 chemicals was down over the previous five years. And in the 10-year period ending in 1982, output of 20 of the 50 top products declined. In the comparable period ending in 1981, 10 showed a production drop.

The 14% output plunge of the Top 50 last year was part

About the Top 50 list of chemical products

Government data, trade association figures, and industry estimates all go into preparing C&EN's annual list of the Top 50 chemical products, ranked by production volume. The federal government is relied upon most heavily, but when government figures are not available, other sources, primarily trade associations, are used. Industry sources and C&EN estimates are used only when other data are lacking or incomplete.

Government data are not always accurate—they are only as good as the information that individual companies report. But they are an objective measure of production extending back for many years. Therefore, relatively accurate indications of growth can be made on a consistent basis.

At this time of year, C&EN has access only to preliminary reports of production for 1982. When the government and trade associations issue their final reports, the outcome can be changed, sometimes dramatically. As a result,

production figures for 1981 that appear in the table on page 11 are different in some cases from those published in last year's Top 50 report. The final reports also can affect the rankings of chemicals. The 1981 rankings of 14 of the chemicals listed in the table, for example, are different from those in the similar table published by C&EN a year ago.

The list itself covers production figures for the U.S. and includes chemicals produced for export. Candidates for the list include all basic, intermediate, and chemically homogeneous finished products. These range from chemical building blocks such as ethylene and propylene to downstream products such as vinyl acetate and ethylene glycol.

The roster also includes basic inorganic chemicals, but does not include what C&EN considers to be minerals, such as salt, potash, gypsum, and sulfur. Lime is included because it is processed and has many chemical and industrial

applications. Refractory (dead-burned) dolomite is excluded in the calculations of lime production.

In the organics list, such petrochemical feedstocks as ethane, butane, and propane are excluded arbitrarily, because they are considered to be products of oil companies and because they have many nonchemical uses.

There are other gray areas besides lime and petrochemical feedstocks. For example, the basic aromatics—benzene, toluene, and xylene—are included. Admittedly, this makes the list less pure chemically.

Production figures are published by the government and trade associations in a variety of units—millions of pounds, thousands of tons, billions of cubic feet, millions of gallons, metric tons. To provide an accurate ranking and to make comparison of production volumes easier, C&EN not only gives production in common units but converts production to billions of pounds.

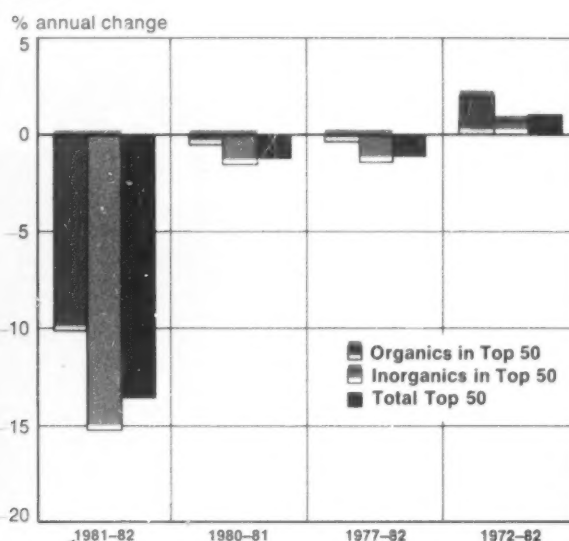
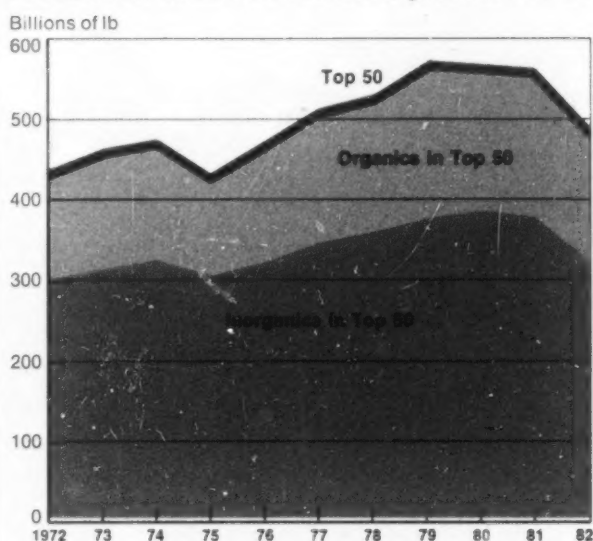
Top 50 chemical output has declined over the past five years

Rank			Production				Average annual growth			
			Billions of lb		Common units ^b					
			1982	1981	1982	1981	1981-82	1980-81	1977-82	1972-82
1	1	Sulfuric acid	64.74	81.35	32,368 tt	40,675 tt	-20.4%	-8.1%	-3.1%	0.4%
2	4	Nitrogen	35.00	35.73	483 bcf	493 bcf	-2.0	2.9	7.8	9.5
3	2	Ammonia	30.99	38.08	15,494 tt	19,038 tt	-18.6	0	-2.5	0.2
4	5	Oxygen	29.22	35.02	353 bcf	423 bcf	-16.6	-1.9	-2.1	0
5	3	Lime ^c	28.40	37.78	14,202 tt	18,890 tt	-24.8	6.8	-5.6	-3.0
6	6	Ethylene	24.66	29.42	24,662 mp	29,418 mp	-16.2	2.6	-0.6	1.7
7	7	Sodium hydroxide	18.45	21.30	9,225 tt	10,652 tt	-13.4	-8.4	-3.3	-1.0
8	8	Chlorine	18.27	21.12	9,136 tt	10,560 tt	-13.5	-7.5	-2.9	-0.8
9	9	Phosphoric acid	17.10	19.83	8,552 tt	9,914 tt	-13.8	-9.4	-0.9	2.5
10	12	Sodium carbonate ^d	15.79	16.56	7,896 tt	8,281 tt	-4.7	0.1	-0.5	0.6
11	15	Toluene ^e	15.25	12.35	1,052 mg	852 mg	23.5	-16.2	-0.3	1.4
12	10	Nitric acid	15.24	18.08	7,621 tt	9,039 tt	-15.7	3.5	-0.9	-0.5
13	11	Ammonium nitrate ^f	14.67	17.58	7,344 tt	8,791 tt	-16.6	-3.7	0.4	0.7
14	14	Propylene	12.30	13.48	12,304 mp	13,482 mp	-8.8	-1.4	-1.6	3.8
15	13	Urea ^g	11.84	16.21	5,918 tt	8,103 tt	-27.0	3.5	5.9	5.6
16	16	Ethylene dichloride	9.99	9.97	9,985 mp	9,974 mp	0.2	-10.2	-1.9	2.5
17	17	Benzene	7.87	9.61	1,070 mg	1,307 mg	-18.1	-34.9	-7.0	-1.6
18	20	Carbon dioxide ^h	7.38	7.96	3,688 tt	3,982 tt	-7.4	7.0	5.5	8.6
19	18	Methanol	7.25	8.58	7,247 mp	8,576 mp	-15.5	19.9	2.3	1.8
20	19	Ethylbenzene	6.61	7.81	6,608 mp	7,812 mp	-15.4	2.2	-4.5	1.5
21	21	Vinyl chloride	6.50	6.87	6,495 mp	6,873 mp	-5.4	6.3	1.6	2.5
22	22	Styrene	5.87	6.68	5,865 mp	6,679 mp	-12.1	-1.1	-3.1	-0.1
23	23	Xylene	5.29	6.39	730 mg	881 mg	-17.1	-3.1	-2.7	-0.1
24	24	Terephthalic acid ⁱ	4.97	6.23	4,974 mp	6,234 mp	-20.2	3.0	-1.7	5.3
25	27	Hydrochloric acid	4.97	4.89	2,485 tt	2,444 tt	1.6	-15.8	-1.8	0.6
26	26	Ethylene oxide	4.87	5.11	4,874 mp	5,109 mp	-4.7	-2.1	2.2	2.1
27	25	Formaldehyde ^j	4.68	5.72	4,684 mp	5,720 mp	-18.2	3.0	-5.0	-1.9
28	30	Ethylene glycol	3.99	4.14	3,993 mp	4,142 mp	-3.6	-5.6	1.7	0.6
29	29	Ammonium sulfate	3.57	4.22	1,787 tt	2,111 tt	-15.4	-1.2	-3.9	-0.4
30	28	p-Xylene	3.20	4.53	3,196 mp	4,532 mp	-29.4	6.9	0.1	3.8
31	32	Acetic acid	2.75	3.07	2,751 mp	3,074 mp	-10.4	3.3	1.4	2.1
32	31	Cumene	2.69	3.31	2,686 mp	3,309 mp	-18.7	-4.3	0.3	1.6
33	36	Aluminum sulfate	2.38	2.41	1,189 tt	1,206 tt	-12.5	-6.2	-1.1	0
34	34	Carbon black	2.29	2.73	2,290 mp	2,730 mp	-16.1	7.2	-7.2	-3.2
35	35	Phenol ^k	2.13	2.58	2,134 mp	2,578 mp	-17.4	0.4	-1.8	1.1
36	39	Acrylonitrile	2.02	2.00	2,016 mp	1,996 mp	1.0	9.1	4.1	6.1
37	40	Vinyl acetate	1.88	1.94	1,876 mp	1,936 mp	-3.1	0.7	3.4	4.5
38	33	Butadiene ^l	1.83	2.99	1,831 mp	2,986 mp	-38.8	6.7	-10.9	-6.4
39	37	Sodium sulfate ^m	1.79	2.33	893 tt	1,164 tt	-23.2	2.2	-5.7	-3.9
40	38	Acetone	1.76	2.14	1,757 mp	2,144 mp	-18.0	3.8	-4.6	0.1
41	41	Calcium chloride ⁿ	1.75	1.83	875 tt	917 tt	-4.4	13.1	-2.0	-2.9
42	43	Propylene oxide	1.48	1.73	1,477 mp	1,734 mp	-14.8	-1.9	-4.6	-0.3
43	44	Isopropyl alcohol	1.30	1.67	1,301 mp	1,669 mp	-22.2	-9.1	-7.2	-3.1
44	46	Sodium silicate	1.30	1.48	650 tt	738 tt	-12.2	-6.0	-3.1	-0.2
45	45	Titanium dioxide	1.28	1.50	641 tt	750 tt	-14.7	-4.7	-1.4	-0.8
46	42	Cyclohexane	1.27	1.82	1,272 mp	1,819 mp	-30.2	-7.4	-10.7	-5.7
47	47	Sodium tripolyphosphate	1.27	1.38	633 tt	689 tt	-8.0	-12.7	-2.5	-4.8
48	49	Adipic acid	1.20	1.21	1,197 mp	1,210 mp	-1.1	0.8	-4.9	-2.1
49	48	Acetic anhydride	1.06	1.25	1,061 mp	1,248 mp	-15.0	-15.0	-6.7	-3.9
50	50	Ethanol	1.02	1.32	1,022 mp	1,317 mp	-22.7	-9.2	-5.3	-5.8
TOTAL ORGANICS IN TOP 50			157.53	175.24			-10.1%	-0.5%	-0.4%	1.9%
TOTAL INORGANICS IN TOP 50			320.72	378.05			-15.2%	-1.5%	-1.4%	0.7%
GRAND TOTAL OF TOP 50			478.25	553.29			-13.6%	-1.2%	-1.1%	1.0%

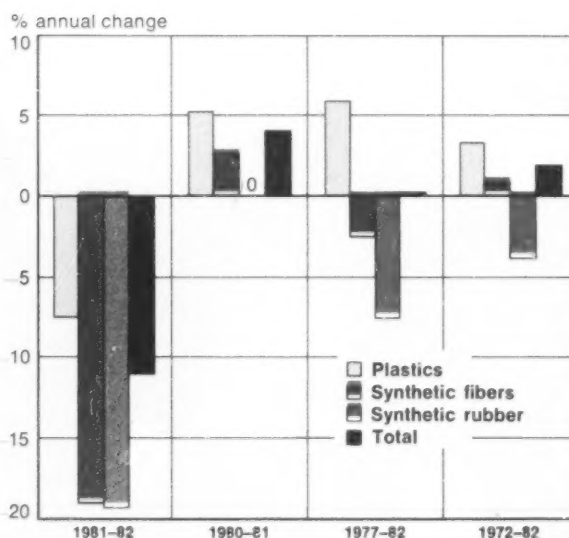
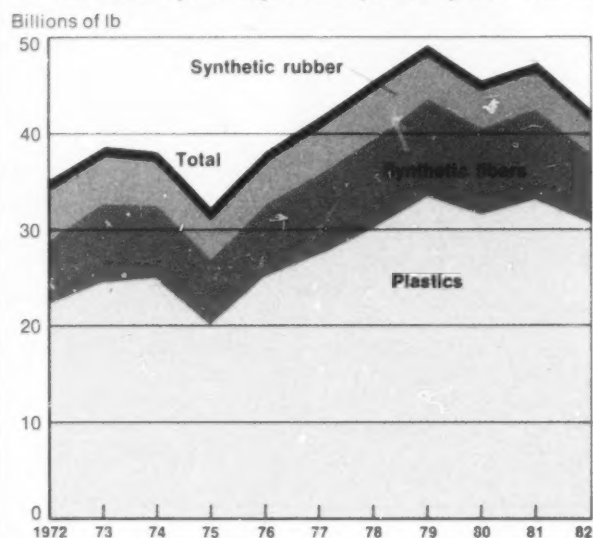
a Revised. b tt = thousands of tons, bcf = billions of cubic feet, mp = millions of pounds, mg = millions of gallons. c Except refractory dolomite. d Synthetic and natural. e All grades. f Original solution. g 100% basis. h All forms. i Includes both acid and ester without double counting. j 37% by weight. k Synthetic only. l Rubber grade. m High and low purity. n Solid and liquid. Sources: Bureau of the Census, Bureau of Mines, International Trade Commission, C&EN estimates.

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Production of basic chemicals plummeted in 1982...



... as did output of plastics, fibers, and rubber



of an overall decline marked by a 16% decrease in the Federal Reserve Board's industrial production index for all basic chemicals. For many of the Top 50 products, the decline was severe: 35 registered double-digit percentage decreases from 1981, and output of 10 of those fell more than 20%.

To a great extent, last year's biggest declines came in products—lime, butadiene, sodium sulfate, isopropyl alcohol, cyclohexane, and ethanol—whose output has been shrinking for a decade or more anyway. But other big drops resulted from economic weaknesses that are more of the moment: sulfuric acid and urea, down 20% and 27%, respectively, because of another poor year for the fertilizer industry, and terephthalic acid and *p*-xylene, down 20% and 29%, respectively, because of an-

other bad performance by polyester fibers (whose production was down 24% in 1982).

The widespread decreases in production hit inorganic chemicals hardest, as they did in 1981—down an average 15%. But organic chemicals, which declined less than 1% in 1981, hardly made it through the year unscathed. Overall, organics output dropped 10% in 1982.

The cause of this big decline in the organics sector is apparent in the performance of the end uses of many of them: plastics, synthetic fibers, and synthetic rubber products, all closely tied to the consumer economy. Output of plastics was down 8% overall; output of fibers fell 19%; and output of rubber dropped 19%.

The plastics slump affected the thermosets the most. Overall, their production declined an average of 14% in

1982 slump affected production of nearly every polymer

Production	Billions of lb		Common units					Average annual growth			
	1982	1981	1982	1981	1980	1977	1972	1981-82	1980-81	1977-82	1972-82
PLASTICS (millions of lb)											
Thermosetting resins	4.30	5.01	4,304	5,010	4,517	3,943	3,480	-14.1%	10.8%	1.8%	2.1%
Phenolic and other tar acid resins	2.01	2.33	2,005	2,333	1,745	1,458	1,453	-14.1	33.7	6.6	3.3
Urea resins	1.00	1.17	996	1,165	1,311	963	739	-14.5	-11.1	0.7	3.0
Polyesters (unsaturated)	0.86	1.00	860	997	952	1,061	933	-13.7	4.7	-4.1	-0.8
Epoxies (unmodified)	0.29	0.34	286	336	323	261	184	-14.9	4.0	0.9	4.5
Melamine resins	0.16	0.18	157	179	186	200	171	-12.3	-3.8	-4.7	-0.9
Thermoplastic resins	25.80	27.52	25,797	27,524	26,444	22,753	18,255	-6.3%	4.1%	2.5%	3.5%
Low-density polyethylene	7.46	7.69	7,455	7,693	7,189	6,471	5,274	-3.1	7.0	2.9	3.5
Polyvinyl chloride and copolymers	5.33	5.71	5,328	5,707	5,485	5,253	4,259	-6.6	4.1	0.3	2.3
High-density polyethylene	4.89	4.70	4,886	4,695	4,531	3,652	1,325	4.1	3.6	6.0	7.7
Polystyrene and copolymers	4.65	5.47	4,653	5,474	5,540	4,630	4,671	-15.0	-1.2	0.1	0
Polypropylene and copolymers	3.48	3.96	3,475	3,955	3,699	2,747	1,726	-12.1	6.9	4.8	7.2
TOTAL^a	30.10	32.53	30,101	32,534	30,961	22,696	21,735	-7.5%	5.1%	5.8%	3.3%
SYNTHETIC FIBERS (millions of lb)											
Cellulosics	0.58	0.77	584	770	806	888	1,394	-24.7%	-4.5%	-8.1%	-8.3%
Rayon	0.39	0.51	388	509	490	598	965	-23.5	3.9	-8.3	-8.7
Acetate ^b	0.20	0.26	196	261	316	290	429	-23.1	-17.4	-7.5	-7.5
Noncellulosics	7.35	9.03	7,348	9,023	8,741	8,098	5,929	-18.6%	3.3%	-1.9%	2.2%
Polyester	3.17	4.18	3,169	4,173	3,989	3,642	2,339	-24.0	4.7	-2.7	3.1
Nylon ^c	1.93	2.33	1,932	2,333	2,358	2,326	1,975	-17.2	-1.1	-3.7	-0.2
Glass fiber	0.90	1.04	899	1,041	867	787	572	-13.6	20.0	2.7	4.6
Olefin	0.72	0.79	724	785	748	634	417	-7.8	4.9	7.3	5.7
Acrylic ^d	0.62	0.69	624	691	779	709	626	-9.7	-11.3	-2.5	0
TOTAL^a	7.93	9.79	7,932	9,793	9,547	8,986	7,323	-19.0%	2.8%	-2.5%	0.8%
SYNTHETIC RUBBER (thousands of metric tons)											
Styrene-butadiene ^e	1.93	2.28	876	1,032	1,074	1,333	1,476	-15.4	-4.0	-8.1	-5.1
Polybutadiene	0.64	0.75	288	342	311	361	294	-14.7	9.9	-4.4	-0.2
Ethylene-propylene	0.27	0.39	123	178	144	158	90	-30.8	23.6	-4.9	3.2
Neoprene	0.26	0.32	119	143	151	165	1	-18.8	-5.3	-6.3	1
Nitrile	0.10	0.15	45	66	70	70	73	-33.4	-5.7	-8.5	-4.7
Other ^g	0.40	0.58	181	261	272	267	1	-30.0	-4.0	-7.5	1
TOTAL^a	3.60	4.46	1,632	2,021	2,022	2,416	2,417	-19.3%	6	-7.6%	-3.8%

^a Totals are for those products listed. Totals may not add because of rounding. ^b Includes diacetate and triacetate yarn. Does not include cigarette filters. ^c Includes aramid. ^d Includes modacrylic. ^e Excludes high-styrene latex. ^f Data for neoprene and "other" were combined in 1972. ^g Includes butyl, polyisoprene, chlorosulfonated polyethylene, polyisobutylene, and acrylo, fluoro, polysulfide, and silicone elastomers. Before 1982, butyl and polyisoprene were reported separately; they have been retroactively added to "other" here.

1982, and two resins—unsaturated polyester and melamine—now show a compounded decline over both the past five and the past 10 years.

Production of thermoplastics fell a relatively slight (on last year's terms) 6%, buoyed by a healthy 4% increase in high-density polyethylene output. But every other big resin registered a decline. Production of polypropylene, robust for a number of years, was down sharply, and that of polystyrene continued its losing ways. Production has been absolutely flat over the past 10 years.

In the synthetic fibers sector, results were even more dismal. The long-term decay of the cellulose market accelerated with an average 25% drop in output last year. In the noncellulosics area, which had an overall decrease of 19%, cuts in production were substantial. Nylon's

performance was bad enough to push its 10-year record to a decline. Output of acrylic fibers during the past decade has been flat. Overall, synthetic fiber output has barely grown at all since 1972.

The synthetic rubber sector maintained its part as sick man of the chemical industry last year. Except for ethylene-propylene rubber, whose output was down 31% in 1982, every synthetic rubber category has been declining for the past 10 years (C&EN, April 25, page 23). The worst is styrene-butadiene rubber, the major product, whose production was down 15% last year and down a compounded 5% for the 10-year period. And three categories—ethylene-propylene, nitrile, and others—all recorded production declines last year of more than 30%. □

Sales down at largest chemical producers

William J. Storck, C&EN New York

Last year was marked by falling chemical production and prices brought on by weak demand both in the U.S. and in export markets, leaving the largest chemical producers in the U.S. in pretty sorry shape by year's end. And it has them looking longingly for a turnaround later in 1983.

Chemical companies were affected during the year by a number of factors. On the demand side poor housing and automobile markets led to problems for a number of chemical products including fibers and plastics. In addition, the poor farm economy played havoc with the fertilizer industry. And the effect did not stop at commodity chemicals. It extended to specialties, which usually are not hurt by recessions.

As a result, production of chemicals and allied products for 1982 dropped 9% from the year before, and basic chemicals production fell 16%. The value of manufacturers' shipments for chemicals and allied products declined 3.5%; for basic chemicals, it was down 10.5%. Chemical exports fell 6% and the chemical trade surplus dropped 12% from 1981 levels.

The recession, quite naturally, led to cost cutting, payroll slashing, and shucking of unprofitable lines with little future—but to no avail. The companies' earnings from chemical operations still plummeted.

The incidence of poor results was not just widespread, it was universal. Every one of the 50 largest chemical producers (in terms of sales) had a decline in chemical sales in 1982 from the year before. And all but one—Ethyl—posted a drop in operating profits (sales minus costs of goods and administrative costs) from the year before. Combined chemical sales of the Top 50 producers fell 10.6% from 1981 to \$100.6 billion.

However, when compared to the fall in operating profit, the 10.6% sales drop looks almost good. Among 44 companies at which chemical operating profits can be measured, this measure fell an average of 55.2% from 1981 to \$3.79 billion. The result was that chemical operating profit margins were cut in half, dropping to 4.0% in 1982 from 8.0% the year before.

The cutting of operations and the low level of capital spending in the chemical industry also were apparent in results from chemical producers. Chemical assets among the 44 companies that provide them fell 2.2% in 1982 to \$81.4 billion. As a result, chemical operating return on assets (operating profit as a percentage of chemical assets) decreased more than chemical operating



profit margins, dropping to 4.6% in 1982 from 10.1% in 1981.

Three of the Top 50 companies are new to the list this year. Nalco Chemical has replaced Akzona, which, since it was acquired by Enka last year, no longer reports its U.S. results. Merck moved up to 49th place this year and Kaiser Aluminum & Chemical, because of a less than 1% drop in chemical sales during the year, rose to 50th place from 63rd last year.

A number of companies improved their rankings in 1982. W. R. Grace moved up to ninth place from 10th in 1981, Allied to 10th from 11th, Phil-

lips to 11th from 12th, Eastman Kodak to 13th from 14th, Rohm & Haas to 17th from 18th, Texaco to 21st from 22nd, Ethyl to 22nd from 23rd, and Ciba-Geigy to 27th from 31st. In addition, Shell Oil, Mobil, Hercules, Ashland Oil, Union Oil of California, Standard Oil of California, Mobay, B. F. Goodrich, and Dow Corning all moved up on the list.

Only 10 companies dropped in rank in 1982. One of the largest drops was Tenneco, a company that shed much of its chemical operations during the year. It fell to 31st place in 1982 from 21st in 1981. Another big drop was for U.S. Steel, which fell to 32nd place from 24th place the year before. Other companies whose rank dropped were Celanese, Atlantic Richfield, Gulf Oil, American Cyanamid, Borden, International Minerals, Diamond Shamrock, and CF Industries.

There are some fuzzy areas in the Top 50 list. First of all, not every company that could be included is on the list, because of lack of reporting of chemical operations. Large chemical producers that do not break out their chemical sales include General Electric, Procter & Gamble, and now Akzona. Also, there is a problem of companies including in their chemical operations large volumes of nonchemical products. There are a number of such companies on the list.

Another problem is that some companies report some, but not all, of their chemical sales. PPG Industries, for instance, reports a chemical sales figure, but other chemical operations are included in its pigments operations, thus making them impossible to estimate. Another example of this is Occidental Petroleum, which before this year reported industrial chemical and agricultural chemical sales. This year, however, agricultural chemicals have been combined with the company's meat-packing operations to form a division called agribusiness. Because the agricultural chemical operations figures could not be obtained, C&EN could report only

All of Top 50 producers had sales drops in 1982

Rank 1982	Rank 1981 ^a	Company	Chemical sales 1982 (\$ million)	Change from 1981	Chemical sales as % of total sales	Industry classification	Chemical operating profit ^b	Change from 1981	Chemical operating profits as % of total operating profits	Oper- ating profit margin ^c	Identifi- fiable chem- ical assets	Chem- ical assets % of total assets	Operating return on chemical assets ^d
1	1	Du Pont	\$10,841	-5.8%	32.5%	Diversified	\$417	-63.7%	10.6%	3.8%	\$7745	36.6%	5.4%
2	2	Dow Chemical	3,252	-12.1	77.7	Basic chemicals	226	-63.1	63.5	2.7	8124	68.8	2.8
3	3	Exxon	7,259	-14.0	7.1	Petroleum	47	-86.5	0.6	0.6	5047	8.1	0.9
4	4	Monsanto	5,737 ^e	-9.1	90.7	Basic chemicals	497	-26.0	99.2	8.7	5234	86.1	9.5
5	5	Union Carbide	4,985	-13.7	55.0	Basic chemicals	294	-49.3	44.7	5.9	6027	57.3	4.9
6	7	Shell Oil	3,085	-14.4	15.4	Petroleum	-56	def	def	def	3841	18.0	def
7	6	Celanese	3,062	-18.4	100.0	Basic chemicals	39	-82.3	100.0	1.3	2862	100.0	1.4
8	8	Standard Oil (Ind.)	2,786	-9.8	9.4	Petroleum	133	-36.7	3.7	4.8	2530	10.6	5.3
9	10	W. R. Grace	2,654	-4.0	43.2	Specialty chemicals	303	-23.5	50.2	11.4	1608	34.5	18.8
10	11	Allied	2,407	-13.7	39.0	Diversified	105	-50.2	13.4	4.4	1726	27.5	6.1
11	12	Phillips Petroleum	2,356	-4.6	15.0	Petroleum	23	-83.6	1.0	1.0	1563	14.9	1.5
12	9	Atlantic Richfield	2,242	-18.1	8.3	Petroleum	-96	def	def	def	2608	12.1	def
13	14	Eastman Kodak	2,151	-8.4	19.9	Photo equipment	205	-29.1	11.0	9.5	2001	19.3	10.2
14	15	Mobil	2,148	-7.6	3.3	Petroleum	6	-95.1	0.1	0.3	2075	5.8	0.3
15	16	Hercules	2,040	-10.3	82.6	Basic chemicals	75	-55.9	65.8	3.7	1468	90.4	5.1
16	13	Gulf Oil	2,006	-18.3	6.6	Petroleum	-329	def	def	def	1232	6.6	def
17	18	Rohm & Haas	1,727	-1.9	94.5	Basic chemicals	156	-16.6	98.7	9.0	1008	90.7	15.5
18	17	American Cyanamid	1,698 ^e	-12.7	49.2	Basic chemicals	100	-49.5	43.4	5.9	1308	56.5	7.6
19	19	Stauffer Chemical	1,618	-6.3	100.0	Basic chemicals	285	-7.3	100.0	17.6	1756	100.0	16.2
20	20	American Hoechst	1,506 ^e	-6.4	100.0	Basic chemicals	na	na	na	na	na	na	na
21	22	Texaco	1,497	-16.7	3.2	Petroleum	-20	def	def	def	953	4.5	def
22	23	Ethyl	1,411 ^e	-6.9	87.4	Basic chemicals	161	4.5	84.5	11.4	959	86.7	16.8
23	28	Air Products ^f	1,359	-0.2	86.6	Basic chemicals	189	-4.2	93.7	13.9	1596	73.6	11.8
24	27	FMC	1,319	-4.6	37.7	Machinery	149	-23.4	81.7	11.3	1084	39.2	13.7
25	31	Ciba-Geigy	1,285	-0.9	68.0	Specialty chemicals	na	na	na	na	na	na	na
26	26	Occidental Petroleum	1,260 ^g	-11.5	6.7	Petroleum	15	-86.4	0.8	1.2	1209	8.8	7.1
27	25	Borden	1,220 ^e	-14.4	29.7	Dairy products	86	-37.7	29.5	7.0	1271	49.1	6.8
28	30	Ashland Oil	1,197	-10.0	13.1	Petroleum	28	-31.7	8.3	2.3	402	9.5	7.0
29	33	Union Oil of Calif.	1,153	-7.6	10.6	Petroleum	90 ^h	-19.3	11.1	7.8	671	7.9	13.4
30	32	Mobay	1,132	-9.4	100.0	Basic chemicals	3 ^h	-94.6	100.0	0.3	1213	100.0	0.3
31	21	Tenneco	1,108	-7.5	7.4	Petroleum	15	-53.1	0.8	1.4	963	6.2	1.6
32	24	U.S. Steel	1,077	-24.6	5.7	Steel	-31	def	def	def	592	3.0	def
33	34	Standard Oil of Calif.	1,047	-14.1	3.0	Petroleum	-16 ^h	def	def	def	825	4.0	def
34	38	B. F. Goodrich	1,015	-3.1	33.8	Rubber products	1	-96.3	def	0.1	1186	50.0	0.1
35	29	International Minerals ⁱ	1,013	-17.4	64.9	Agri. chemicals	169	-43.0	79.1	16.7	1345	69.3	12.6
36	36	Olin	1,012	-6.0	55.5	Basic chemicals	22	-53.7	16.6	2.2	914	61.7	2.4
37	35	Diamond Shamrock	996	-12.7	31.3	Petroleum	83	-44.9	34.2	8.3	1024	32.1	8.1
38	37	CF Industries	919 ^e	-12.8	100.0	Agri. chemicals	-38	def	def	def	1008	100.0	def
39	41	BASF Wyandotte	895	-7.5	100.0	Basic chemicals	-3	def	def	def	735	100.0	def
40	39	PPG Industries	893	-11.8	30.1	Glass products	39	-67.5	16.4	4.4	1045	32.0	3.7
41	40	Williams Cos.	828 ^e	-15.9	49.0	Agri. chemicals	-30	def	def	def	981	51.7	def
42	42	Reichhold Chemicals	815	-14.2	100.0	Basic chemicals	17	-52.8	100.0	2.1	356	100.0	4.8
43	43	Lubrizol	812	-9.7	100.0	Specialty chemicals	103	-34.4	100.0	12.7	569	100.0	18.1
44	44	Eli Lilly	789	-5.8	26.6	Drugs	147	-12.0	20.8	18.6	838	26.6	17.5
45	45	National Distillers	758	-10.9	41.4	Alcoholic beverages	58	-49.1	50.9	7.7	614	35.9	9.4
46	46	Farmland Industries	664	-18.6	11.8	Agri. supplies	-8	def	def	def	486	29.3	def
47	49	Dow Corning	663	-8.2	100.0	Specialty chemicals	53 ^h	-30	100.0	8.0	na	na	na
48	51	Nalco Chemical	644	-3.4	100.0	Specialty chemicals	99	-18.9	100.0	15.4	465	100.0	21.3
49	53	Merck	644	-3.0	21.0	Drugs	60	-18.1	9.9	9.3	566	18.6	10.6
50	63	Kaiser Aluminum	642	-0.3	22.1	Nonferrous metals	44	-53.0	80.0	6.9	519	14.2	8.5

^a Revised. ^b Operating profit defined as sales less administrative expense and cost of selling. ^c Operating profit as a percentage of chemical sales. ^d Operating profit as a percentage of identifiable chemical assets. ^e Chemical sales include significant amounts of nonchemical products. ^f Fiscal year ended Sept. 30, 1982. ^g Does not include all chemical products. ^h Chemical net profit. ⁱ Fiscal year ended June 30, 1982. na = not available. def = deficit.

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Leading companies in chemical profits, assets, and profitability

Rank	Operating profit (\$ millions)	Operating profit margin ^a	Chemical assets (\$ millions)	Return on chemical assets ^b
1	Monsanto \$471	Eli Lilly 18.6%	Dow Chemical \$8124	Nalco Chemical 21.3%
2	Du Pont 417	Stauffer Chemical 17.6	Du Pont 7745	W. R. Grace 18.8
3	W. R. Grace 303	International Minerals 16.7	Union Carbide 6027	Lubrizol 18.1
4	Union Carbide 294	Nalco Chemical 15.4	Monsanto 5234	Eli Lilly 17.5
5	Stauffer Chemical 285	Air Products 13.9	Exxon 5047	Ethyl 16.8
6	Dow Chemical 226	Lubrizol 12.7	Celanese 2862	Stauffer Chemical 16.2
7	Eastman Kodak 205	W. R. Grace 11.4	Atlantic Richfield 2608	Rohm & Haas 15.5
8	Air Products 189	Ethyl 11.4	Standard Oil (Ind.) 2530	FMC 13.4
9	International Minerals 169	FMC 11.3	Gulf Oil 2075	Union Oil of Calif. 12.6
10	Ethyl 161	Eastman Kodak 9.5	Eastman Kodak 2001	International Minerals 11.8
11	Rohm & Haas 156	Merck 9.3	Stauffer Chemical 1756	Air Products 10.6
12	FMC 149	Rohm & Haas 9.0	Allied 1726	Merck 10.2
13	Eli Lilly 147	Monsanto 8.7	W. R. Grace 1608	Eastman Kodak 9.5
14	Standard Oil (Ind.) 133	Diamond Shamrock 8.3	Air Products 1596	Monsanto 9.4
15	Allied 105	Dow Corning 8.0	Phillips Petroleum 1563	National Distillers

a Chemical operating profit as a percentage of chemical sales. b Chemical operating profit as a percentage of chemical assets.

the industrial chemical operations figures. Because of this, Occidental's chemical sales figures are much lower than last year—and to avoid confusion, the company's 1982 chemical sales figure was compared only to the comparable one for 1981. In addition, Occidental's 1981 rank was restated as if agricultural chemical sales had been eliminated. This lowered the company's chemical

ranking on paper to 26th from 12th place as reported last year.

Thus, with these caveats in mind, it must be remembered that the rankings and, indeed, many of the figures from operations are only approximate. Therefore, they should be used only as a general guide to the chemical performance of the companies. □

Oil companies come in poor third in chemical performance

The 1982 recession hit everyone that had interests in chemicals, but it hit the oil companies harder than it did chemical firms or the diversified companies.

Although chemical companies did not lead in all categories, they at least turned in a respectable performance, vying with the diversified for top honors.

For comparison, 44 of the 50 firms that reported their chemical results can be used in a consistent manner. This involves similar reporting of chemical sales, assets, and operating profits.

Combined sales of the 44 companies were \$93.8 billion, a decrease of 11% from 1981. Their chemical operating profits totaled \$3.79 billion, down 55% from the year before. And their chemical

assets amounted to \$81.4 billion, down 2% from 1981.

Of the 44 firms, 19 were classified as chemical companies with combined chemical sales of \$41.5 billion, or 44% of the total. The 12 oil companies had combined sales of \$27.9 billion, or 30% of the total. And the 13 remaining companies had combined sales of \$24.4 billion, or 26% of the total.

Chemical sales for the 19 chemical companies fell an average of 11% in 1982, right on the average for the total group of 44 companies. Sales for the diversified and other companies dropped an average of 9%. But for the oil companies, chemical sales were off an average of 13% from the year before.

Although the group of chemical companies was in the middle in sales declines last year, their 41% drop in chemical operating profit to \$5.7 billion was not so bad as for the other groups. The oil companies showed a combined \$151 million deficit in 1982. And the other companies had chemical operating profits of \$3.8 billion, off 52% from 1981.

The asset decline, however, for chemical companies was greatest of the three groups. Whereas chemical assets for this group dropped 2.5% to a total of \$38.3 billion, the oil companies' chemical assets fell 2.3% to \$23.4 billion. The other companies' chemical assets fell 1.4% to \$19.7 billion.

\$ Billions	Chemical sales	Change from 1981	Chemical operating profits	Change from 1981	Chemical profit margin ^a	Chemical assets	Change from 1981	Chemical return on assets ^b
19 chemical companies ^c	\$41.48	-11%	\$2.66	-41%	5.7%	\$38.32	-2.5%	7.0%
12 oil companies ^c	27.94	-13	-0.15	del	del	23.45	-2.3	del
13 other	24.40	-9	1.27	-52	5.2	19.67	-1.4	6.5
TOTAL ^c	\$93.82	-11%	\$3.79	-55%	4.0%	\$81.44	-2.2%	4.6%

a Chemical operating profits as a percentage of chemical sales. b Chemical operating profits as a percentage of chemical assets. c Four chemical companies—Möbay, Ciba-Geigy, American Hoechst, and Dow Corning—and two oil companies—Standard Oil of California and Union Oil of California—have been excluded. del = deficit.

Surge in Dumping Plagues European Chemical Federation

Former CEFIC official cites economic downturn as reason for rises in unfair trade practices and imposition of antidumping duties

Dermot A. O'Sullivan, C&EN London

In the Brussels headquarters of the Commission of the European Communities, someone has affixed to one of the doors a cardboard sign that reads "No dumping." Though put there as a somewhat facetious gesture, it serves as a reminder to visitors that they are at the nerve center of activities surrounding investigation of alleged unfair trading practices affecting the 10 member countries of the European Economic Community.

Dumping refers to a company's selling product in another country at prices less than those charged in the country of origin. Under the international trading rules of the General Agreement on Tariffs & Trade (GATT), for dumping in its total sense to occur, there must be injury to local producers arising from the low-priced imports. As a defensive countermeasure, companies that see their business harmed by the imports seek a compensatory antidumping duty to offset the price differential.

Sensitized by the worldwide economic slowdown, EEC has been the target of a wide variety of dumped products. In recent months, these have ranged from louver doors originating in Malaysia, to outboard motors arriving from Japan, and sanitary ware from Czechoslovakia and Hungary. On occasions, as in the case of steel and food products, imposition of antidumping duties has given rise to acrimonious exchanges

between trading partners transcending beyond the commercial level to the political arena.

The focal point of dumping allegations arising from individual EEC companies or trade associations is the Commercial Defense Office of the EC Commission's External Relations Directorate. Acting on these allegations, staff members sift through the evidence, contact companies on both sides of the case whenever possible, and decide whether dumping is taking place.

The first step is publication of a notice that an investigation has been launched. Interested parties have 30 days in which to make their views known to the commission. Then follows the investigation proper, which can take about six months depending on the complexity of the case. If dumping is judged to occur, a provisional duty is imposed. Alternatively, the "offending" parties may

adjust upward their selling price in EEC, and the commission withdraws its case. After setting a provisional duty, there follows a period of fine tuning leading to imposition of a definitive duty. This must be applied within 12 months of the start of a case.

The European Council of Chemical Manufacturers' Federations (CEFIC) is the channel through which most of the dumping complaints involving chemicals reach the commission. Since joining CEFIC in 1979 as trade and commercial affairs coordinator, Gareth H. Davies has been responsible for screening these complaints before passing them on.

A few weeks ago, Davies retired from CEFIC and was succeeded by Michael Cockburn. Before stepping down, he shared with C&EN's O'Sullivan some of his experiences and thoughts after nearly four years performing a difficult task.

C&EN: During your time with CEFIC, it seems that you have been heavily involved with dumping complaints.

Davies: I came in September 1979, and by September 1980 I was up to my neck in my first six petrochemical dumping cases. Since I've been here, we've looked at about 50 cases.

C&EN: How does that compare with earlier years?

Davies: Before I came, CEFIC had about five cases in eight years.

C&EN: Has the upswing in antidumping activity been a reflection of the economic downturn?

Davies: It has been a direct effect of the economic situation. When the

economy begins to pick up again, concern over dumping undoubtedly will lessen.

C&EN: Have changes in the parity between major currencies also had some influence?

Davies: Yes, coupled with declining demand both in Western Europe and the U.S., there has been a period when the dollar was weak. The relatively strong dollar in recent months has been in Europe's favor. It's harder for a producer to sell material in areas of weaker currencies. The strength of the dollar has reinforced the antidumping measures that have been taken.

C&EN: Do you see these antidumping measures as something of a panacea?

Davies: We never fool ourselves that an antidumping duty is going to solve our problems. What it does do is give us an opportunity to try to improve the situation.

C&EN: Have there been any followup studies to measure what the effects have been of antidumping duties coming into force?

Davies: The first crude analysis shows that even the initiation of an antidumping action is sufficient to create a pause in the activity. At worst, you can say that antidumping actions as a whole have stopped the slide into disaster.

C&EN: Looking at the antidumping duties that the EC Commission has applied to chemicals, there appears to be a wide gap between the dumping price margins that have been claimed and the final level of duty applied.

Davies: You do find that there is a discrepancy between a dumping margin of, say, 50%, and a 10% applied dumping duty. This is because the commission, while acknowledging that there was dumping, may decide that the amount of injury suffered was far less than the dumping margin would indicate. It's getting tougher to measure this when you have a product with a large overcapacity. I have the greatest deal of sympathy for the commission.

C&EN: CEFIC took issue with the EC Commission when it imposed a 4% preliminary dumping duty on U.S. styrene.

Davies: We got mad about that. A 4% duty was so derisory that it just was not worth having. Our position was that the duty was so ridiculously low it could tempt people to jump over it and come in. It was the one occasion where we said publicly that we would try to get retroactive duties applied. As it was, the final definitive duty of 14.8% was more satisfactory, although some of the exporting companies were excluded.

C&EN: What does CEFIC do when it gets a dumping complaint from a company or group of companies?



We don't think that dumping actions have soured relations with our trading partners

Davies: We look for five things. One is the action affecting a major proportion of EEC industry; second, is there dumping?; third, is there injury?—dumping of itself is not enough; fourth, evidence to back up the claim; and fifth, a short statement from each company about its individual injury. The companies also must provide us with such statistics as imports, share of the market, capacity utilization, etc. To get the whole picture, we must ask a lot of questions. We must satisfy ourselves that there is enough to go on before we go to the commission.

C&EN: On average, how long does it take to get all the information together?

Davies: It depends. We had a case through in a month when there was a limited number of producers. If there are many, it lengthens the time.

The normal situation is that if people were to come to us today, say five or six producers of a major product, we would send out our questionnaire seeking the bare bones of the case, and asking all producers if they are interested in taking part.

Collection of the information takes

us anywhere from a week to three months. If we have what looks like a case, we tell the commission that we have a draft case we wish to present and ask for their views. The commission doesn't help us write a case; that would be totally wrong. But it advises whether the evidence in hand is sufficient or, perhaps, lacking. That may add a further month.

C&EN: It's surprising that any of these dumping cases ever come about, considering the machinery involved in their preparation.

Davies: It's a gigantic administrative burden. It really is. There is nothing so bad as an antidumping case. A lot of it is plain number-crunching. But it does take a lot of time because of the sheer weight of the paperwork. And there are practical problems, like estimating consumption and estimating the free market of a product. There can be quite contradictory evidence of this sort of thing.

And there is another problem. Although certain items of antidumping evidence plainly are confidential, some companies are over-secretive and spoil their own case. CEFIC tries to keep the evidence as open as possible. It takes time arguing with the complainants that it is to their advantage to make evidence available.

C&EN: During the preparation of a case, might this be taken as an opportunity for competitors to share information, thereby getting around some of the competition rules set out in the Rome treaty when EEC was created?

Davies: No. CEFIC is very, very careful about this. Sometimes, we have to be the confidential clearing-house of information. Individual companies will send us facts that we can't divulge to other companies. People understand that CEFIC is the repository of a lot of confidential information. Companies come to us not as a means of fixing prices, but in search of survival.

C&EN: CEFIC appears to have had a good batting average on the dumping complaints sent to the commission.

U.S. is target of many CEFIC antidumping actions

Product	Country of origin	Investigation launched	Status
Acrylonitrile	U.S.	April 1982	Case closed
Barium chloride	China, East Germany	August 1982	Continuing
Bisphenol A	U.S.	April 1982	Provisional duty of 37.6%, January 1983
Catalyst for fluid cracking	U.S.	February 1981	Price adjusted, case closed
Cellulosic resins	U.S.	November 1982	Price adjusted, case closed
Choline chloride	East Germany, Romania	April 1983	Continuing
Copper sulfate	Czechoslovakia, Yugoslavia, U.S.S.R.	June 1982	Definitive duty of 19.5%, March 1983
Decabromodiphenylether	U.S.	December 1981	Price adjusted, case closed
DNBP herbicide	Romania	December 1978	Definitive duty of 40%, May 1979
Hexamethylenetetramine	Czechoslovakia, East Germany, Romania, U.S.S.R.	August 1982	Provisional duty on product from East Germany and U.S.S.R., February 1983; cases against Czechoslovakia, Romania dropped
Lithium hydroxide	U.S., U.S.S.R.	1978	Provisional duty October 1979. Being re-examined
Methylamines	East Germany, Romania	March 1982	Definitive duty of 28.8% on East German product, case against Romania dropped
Oxalic acid	China, Czechoslovakia, East Germany, Hungary	September 1981	Definitive duty of 34.2% on China product May 1982, cases against Czechoslovakia, East Germany, Hungary dropped
Paracetamol	China	December 1981	Price adjusted, case closed
Perchloroethylene	Czechoslovakia, Romania, Spain, U.S.	May 1982	Price adjusted, case closed
Phenol	U.S.	March 1981	Definitive duty ranging from 6.5 to 14.1%, January 1982
Polyethylene, low-density	Czechoslovakia, East Germany, Poland, U.S.S.R.	September 1982	Continuing
Polyvinyl chloride	Czechoslovakia, East Germany, Hungary, Romania	December 1981	Price adjusted, case closed
Soda ash (light)	Bulgaria, East Germany, Poland, Romania, U.S.S.R.	November 1978, reopened April 1982	Definitive duties February 1983, amounts vary by country of origin
Soda ash (heavy)	U.S.	June 1982	Definitive duty of about \$24 per ton, March 1983. Some companies exempt
Styrene	U.S.	July 1980	Definitive duty of 14.8%, June 1981
Thiophene	U.S.	May 1982	Price adjusted, case closed
Trichloroethylene	Czechoslovakia, East Germany, Poland, Romania, Spain, U.S.	October 1981	Price adjusted, case closed
Vinyl acetate	U.S.	July 1980	Definitive duty of 14.3%, May 1981; lower duty applies to some companies
Xanthane gums	U.S.	September 1982	Continuing
Xylene, ortho and para	U.S.	November 1980	Definitive duty of 14.47% on o-xylene, September 1981, and of 14.7% on p-xylene, October 1981

Davies: So far, every case has shown that there has been both dumping and injury.

C&EN: Has CEFIC ever turned away a case?

Davies: Some we have turned down flat. Some have been thrown back to the producers several times when there was lack of evidence. A marketing manager who comes and says he knows that the competition is dumping must prove it. The fact that CEFIC passes on a complaint to the commission doesn't add any more weight to it. We have got to give the commission evidence.

C&EN: What reactions have you had from companies or countries that

have been targeted in your complaints?

Davies: We are criticized sometimes for being too quick with these dumping actions. People say to us, "Isn't there a better way of doing this? Could you talk to us before going ahead?"

We have turned down this suggestion. If you start that, you find that you are negotiating. CEFIC has no rights to negotiate. We cannot be placed in the situation of arbitrator.

One thing that has pleased us is that we don't think that these dumping actions have soured commercial relations with our trading partners. We have talked to the Chemical Manufacturers Association about this, noting that it is the only route

we have of removing a distortion of trade. We believe it has been accepted in those terms by most U.S. firms.

C&EN: Might there be an element of protectionism behind the moves?

Davies: In our view, there is a very big difference between protectionism and defensive measures. We are not protectionists. Defensive, yes.

An idea we are anxious to get across is that we are not accusing other countries or companies of being international criminals. We simply are saying that some of these have been dumping, often inadvertently. And the only means whereby we can apply corrective measures is by going to the commission. □